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CERAMBYCIDAE OF THE GALÁPAGOS ISLANDS*

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Introduction

According to Kuschel (1963), no Cerambycidae have been found in the Juan Fernandez Islands, nor in Desventuradas. Thus the only Cerambycidae currently known from eastern Pacific oceanic islands are from the Galápagos, Cocos, and the Revilla Gigedos. They are treated in the present series of three companion papers.

Charles Darwin, as the record shows (Darwin, 1839; Champion, 1918), was a keen coleopterist, yet during his visit to the Galápagos Islands in September and October, 1835, he found no Cerambycidae (G. R. Waterhouse, 1845; C. Waterhouse, 1877). The first member of this family reported from the archipelago was described by Boheman (1859) from the collections made by the Swedish frigate *Eugenie* in May, 1852, but the "species" named (*Eburia amabilis*) has not since been reported from the Galápagos and, in fact, may not have come from the islands. H.M.S. *Peterel,* which visited the archipelago in June, 1875, likewise found no Cerambycidae, and it was not until the *Albatross* Expedition of April, 1888, that two longicorn species ("*Stenodontes molarius*" and *Eburia lanigera*) were reported (Linell, 1899) the presence of which in the Galápagos has been confirmed subsequently. Dr. G. Baur, who visited the islands from June to September, 1891, captured three species (Linell, 1899), and F. X. Williams, with the California Academy of Sciences Expedition of 1905–1906, ten (Williams, 1907; Van Dyke, 1953). No expedition until the present one has equalled the record of F. X. Williams. The Beebe Expedition of 1923 found one species (Mutchler, 1925); the 1924 St. George Expedition, four (Blair, 1933); G. Bateson's collections of 1925, also contain four (Blair, 1933); and those of Von Hagen in 1935–1936, four (Mutchler, 1938). Of these "species," eleven are here recognized as definitely occurring in the Galápagos

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Islands, to which may be added the two "new" ones described below, for a total of 13. Types of new species are deposited in the collections of the California Academy of Sciences, San Francisco.

Geographical Affinities of the Galápagos Flora

The flora of the Galápagos Islands has been discussed and analyzed on numerous occasions, most comprehensively by Stewart (1911) and Svenson (1935, 1946), and will no doubt be further considered in reports prepared by botanists of the Galápagos International Project. The published accounts are not in agreement as to the origin of the Galápagos flora, and obviously we are in no position to make an independent judgment on this matter. Nevertheless, we believe that it can be said that when the widespread or pan-tropical weedy species and strand plants are disposed of, the literature can be interpreted as indicating that the flora has a great deal in common with that of the west coast of South America, particularly but not exclusively the drier zones; it can also be interpreted as having relationship, especially among the older endemic elements, with the flora of the Caribbean, Central America, and Mexico. Such an explanation, at least as it affects the woody plants, would be consistent with our finding with regard to the Cerambycidae, which as larvae are wood-boring beetles.

Cerambycidae were associated with a number of plant hosts in the Galápagos, but evidence of borings by unidentified members of this family as well as by buprestids, bostrycids, weevils, etc., were seen in many more (table 1).

Endemism and Faunal Affinities of Galápagos Cerambycidae

Mutchler (1925) states that ". . . six conspicuous species of Cerambycidae appear to be of recent introduction, as they were not reported by the earlier writers and these beetles would almost surely have been found, had they been there. They were probably taken over in wood which formed a part of boat's cargo or of the boats themselves." The six species referred to by Mutchler represent all of those reported up to the time his paper was published: *Stenodontes molarius, Achryson galapagoensis, Eburia lanigera, E. bauri* (= *proletaria*), *E. amabilis,* and *Acanthoderes galapagoensis.* (When his statement was made, five of these six species were known only from the Galápagos Islands, although two have been reported subsequently from South America.) However, it should be pointed out that Darwin's visit to the Galápagos in 1835 occurred during the dry season and he obtained relatively few insects altogether, including only 29 species of Coleoptera—less than one-fifth of those found by F. X. Williams of the California Academy of Sciences Expedition of 1905–1906 which spent a year in the archipelago. Thus, the absence of Cerambycidae among his material can hardly be considered significant. The same may be said of the collections brought back by the British H.M.S. *Peterel,* which visited

TABLE 1. *Principal observed woody-plant hosts of seed- and wood-boring beetles—Santa Cruz Island (January–February, 1964).*

Littoral Zone	*Arid Zone*	*Transition Zone*	*Moist Forest Zone*
Cryptocarpus pyriformis	*Acacia macrantha*	*Piscidia erythrina*	*Ochroma lagopus*
Hippomane mancinella	*Parkinsonia aculeata*	*Prosopis dulcis*	*Persea gratissima*
Hibiscus tiliaceus	*Piscidia erythrina*	*Castela galapageia*	*Scalesia pedunculata*
Laguncularia racemosa	*Prosopis dulcis*	*Bursera graveolens*	*Pisonia floribunda*
Avicennia officinalis	*Castela galapageia*	*Croton scouleri*	*Psidium galapageum*
Maytenus obovata	*Bursera graveolens*	*Opuntia echios*	
Rhizophora mangle	*Croton scouleri*	*Jasminocereus howelli*	
Scaevola plumieri	*Opuntia echios*	*Cordea lutea*	
	Jasminocereus howelli	*Maytenus obovata*	
	Cordea lutea	*Psidium galapageum*	
	Scalesia helleri		
	Scalesia affinis		
	Maytenus obovata		

the Islands in 1875. In fact, the New York Zoological Society Expedition of April, 1923, under the direction of William Beebe, upon which Mutchler reported, found only one specimen of cerambycid, although members of the group brought back seven new species of beetles, all in genera not previously reported from the Islands! On the other hand, members of the 1852 expedition aboard the Swedish frigate, *Eugenie,* collected one of the six species referred to by Mutchler; those of the 1887–1888 expedition on the U. S. fisheries steamer *Albatross,* five. The absence of Cerambycidae from the collections of the early expeditions (presumably meaning those prior to the voyage of the *Albatross*) is hardly a convincing argument for their introduction by man. Further, if one excludes the published but doubtfully authentic records of *Eburia amabilis* and *Taeniotes hayi* (see below) and some elements of the obviously endemic *Estola insularis* and *Nesozineus galapagoensis* complexes, only three of the presently known species were not found by Williams during the 1904–1905 expedition of the California Academy of Sciences. Two of these, *Compsa apicalis* and *Desmiphora maculosa* occur on more than one island, which argues somewhat against their subsequent introduction, although there has been extensive commerce between the islands and the mainland in the intervening 50 years. A possible candidate for a recently introduced species is *Eburia proletaria* which has thus far been found on only three islands. Another is

Nesoeme kuscheli (described below), a single example of which was captured at light at the Darwin Station on the first evening we occupied quarters newly constructed from wood imported from Ecuador. Although hundreds of Cerambycidae were attracted to these same lights during the next six weeks, no further examples of this species were taken. However, *N. kuscheli* is not presently known from elsewhere and may ultimately prove to be endemic. Its affinities appear to us to be with forms in Mexico and the West Indies.

While Mutchler's arguments for introduction of the Cerambycidae by man are unconvincing, nevertheless, it is quite possible that early Galápagos visitors and settlers did accidentally introduce some of the species currently living there. Several are known to occur elsewhere, including *Stenodontes molarius* (*sensu lato*) (Baja California, Mexico, Central and South America), *Strongylaspis kraepelini* (*sensu lato*) (Guayaquil, Ecuador), *Achryson galapagoensis* (*sensu lato*) (western South America from Colombia to Chile), *Eburia proletaria* (western South America from Colombia to Chile), and *Compsa apicalis* (Colombia). Some of these species must have reached the Galápagos without the aid of man, since they show some differentiation from mainland populations (mostly at what we interpret as a subspecific level). The most likely candidate for a man-introduced species in this list appears to be *Eburia proletaria,* if, as stated by Blair (1933) and Van Dyke (1953), Galápagos specimens agree with those from South America.

Although the species which appear to be relatively recent adventives (whether they arrived with or without the aid of man) must have come from South America (*Stenodontes molarius* excepted), the principal affinities of the species presumed to be endemic are with Mexico and/or Central America and/or the West Indies. These include *Parandra galapagoensis, Nesoeme kuscheli, Eburia lanigera, Estoloides galapagoensis, Estola insularis,* and *Nesozineus galapagoensis*. Further, several of these break up into allopatric or host-restricted populations of closely related species or subspecies. Thus, although our taxonomic analyses are far from complete, it appears that a distinctive population of the *Estola insularis* complex is attached to *Scalesia affinis* on each of the major islands. On Santa Cruz, the population on *Scalesia helleri* may be different from that on *Scalesia affinis,* agreeing with that associated with *S. helleri* on nearby Santa Fé Island, but our samples are too small to judge. On the other hand, where we have significantly large collections, the separate insular populations on the upland *Scalesia pedunculata* appear to be similar, if not identical, with those of the adjacent lowland *Scalesia affinis*.

Insular allopatry to a lesser extent is also recognizable in populations of *Nesozineus* associated with *Croton,* but apparently not in *Estoloides* associated with *Bursera* and *Scalesia*. The more recently adventive Cerambycidae show less host specificity in general and less variation between populations on the different islands.

TABLE 2. *Known occurrence of Cerambycidae on the principal islands of the Galápagos archipelago.*

	North-Western islands		*North-Central islands*			*Central islands*								*Southern islands*		
	Darwin	Wolf	Pinta	Marchena	Genovesa	Fernandina	Isabela	Santiago	Rábida	Pinzón	Santa Cruz	Baltra	Santa Fé	San Cristóbal	Floreana	Española	Gardner
Parandra																	
galapagoensis							x	x			x						
Stenodontes																	
molarius							x	x		x	x			x	x		
Strongylaspis																	
kraepelini								x			x						
Nesoeme																	
kuscheli											x						
Achryson																	
galapagoensis											x	x		x	x		
Eburia																	
lanigera			x		x	x	x	x	x	x	x		x	x	x	x	x
Eburia																	
proletaria							x	x						x			
Compsa																	
apicalis								x			x						
Desmiphora																	
maculosa						x		x			x						
Estoloides																	
galapagoensis							x	x			x		x				
Estola																	
insularis						x	x	x		x	x		x		x		
Acanthoderes																	
galapagoensis							x	x			x			x			
Nesozineus																	
galapagoensis						x	x	x	x		x			x			

GENERAL ABUNDANCE

On the larger islands during the rainy season, Cerambycidae are numerous in individuals by mainland standards, although species are relatively few. Under what is assumed to have been unusually favorable circumstances, we encountered during a 6-week period, 11 species; during a similar period in the Chiricahua Mountains we found 132 species; in Ecuador an identical effort might have yielded several hundred species. All of the known Galápagos Cerambycidae are nocturnal, and only a few such as *Desmiphora maculosa* and *Nesozineus galapagoensis* were observed also to fly in the daytime, and their diurnal activity was largely limited to the late afternoon or to overcast days.

Being nocturnal, Galápagos Cerambycidae are readily attracted to light. For example, between 7:30 P.M. and 9:30 P.M. on January 20, 1964, 139 individuals were captured at four white lights in the residential area of the Darwin Research Station on Santa Cruz Island as follows:

Nesozineus galapagoensis: 28 ♂♂, 34 ♀♀
Eburia lanigera: 15 ♂♂, 28 ♀♀
Achryson galapagoensis: 8 ♂♂, 12 ♀♀
Estoloides galapagoensis: 4 ♂♂, 6 ♀♀
Desmiphora maculosa: 1 ♂, 3 ♀♀
Acanthoderes galapagoensis: 1 ♂
Stenodontes molarius galapagoensis: 1 ♀

Natural Enemies

Predators of adults. As mentioned previously, adult Galápagos Cerambycidae confine their activity largely to the night. During the hours of darkness their principal predators are insects and other arthopods, and probably only the smaller species are subject to attack. On one occasion, at about 10 P.M., G. Kuschel saw an adult clerid (*Pelonium longfieldae*) attack, overcome, dismember, and devour an adult *Nesozineus*, leaving only the elytra. Carcasses of this species were twice found in spider webs and fragments of a representative of *Estoloides galapagoensis* were once found under loose bark of *Bursera graveolens* adjacent to a scorpion which was presumed to have eaten it. On another occasion, several dead adults of *Stenodontes molarius* with the soft parts removed by fire ants were found on the ground beneath a standing dead *Bursera* tree. Live individuals of *Stenodontes* were found under the bark but there seemed no obvious method for determining whether the fire ants had attacked the beetles while they were on the tree or whether the beetles had died from some other cause.

No vertebrate predators were seen to capture adult beetles at night, although geckos were abundant about the lights and were seen to capture other insects. Diurnal vertebrate predators were seen to capture cerambycids occasionally, but generally they avoided them. Mockingbirds (*Nesomimus parvulus parvulus*) and lava lizards (*Tropodurus albemarlensis*) quickly learned to prey in the morning on insects which had been attracted to protected light installations the night before. The mockingbirds first captured the sphinx moths (most commonly *Phlegathontius rusticus galapagensis*), then the larger noctuids, and finally smaller moths and soft-bodied beetles (avoiding, however, oedemerids of the genera *Oxacis* and *Alloxacis*). On the first morning, a bird was seen to capture and eat a medium-sized *Achryson galapagoensis* and later pick up and drop a large female specimen of *Eburia lanigera*. This last species was by far the most numerous cerambycid about the lights but it was consistently avoided by both mockingbirds and lava lizards, possibly because of the sharp spines on

the thorax, elytral apices and femora, or perhaps because of some noxious quality not evident to us.

Predators and parasites of larvae. At various times larvae of the ostomatid *Temnochila galapagoensis* were found preying on immature stages of Cerambycidae. G. Kuschel found the pupa of *Eburia lanigera* being attacked in its cell in the wood of *Croton scouleri* and E. G. Linsley found a larva being devoured in a sapwood gallery of *Bursera graveolens*. Williams (1926) records larvae of the bethylid *Scleroderma galapagoensis* Brues feeding as external parasites of larvae now known to have been *Parandra galapagoensis* in the wood of tree *Scalesia* (*S. pedunculata typica*) at an elevation of 2,000 feet on James (Santiago) Island, December 27, 1906.

Genera and Species

Parandra galapagoensis Van Dyke

(Figure 9.)

Parandra galapagoensis Van Dyke, 1953, Occ. Pap. Calif. Acad. Sci., no. 22, p. 127.

Parandra (?) sp., Williams, 1926, Proc. Calif. Acad. Sci., ser. 4, vol. 2, p. 350 (host, parasite).

Moderate sized, elongate, surface glabrous, shining, color pale brownish to dark rufous. Male mandibles large, arcuate, notched at apex, inner margin with short tooth before middle and several small teeth at middle; antennae not extending to base of pronotum; submentum without a transverse furrow. Prothorax wider than long, hind angles not produced; disk flattened, almost impunctate. Elytra almost twice as long as broad, sides parallel; disk almost impunctate. Length (exclusive of mandibles), 14–25 mm.

General distribution. Presumably endemic to the Galápagos Islands.

Galápagos distribution. Isabela, Santa Cruz, and Santiago islands.

Seasonal occurrence of adults. Unknown (unemerged adults found in pupal cells in September, December, January).

Host plant. *Scalesia pedunculata* Hooker.

Van Dyke (1953) compared this species with the Mexican *P. brachyderes* Lameere. It differs in the smoother upper surface, curved, toothed mandibles, and almost impunctate undersurface.

Of the 63 specimens available for study, all but eight are from Santiago Island. Three represent the Santa Cruz population and the remaining five that of Isabela.

Comparison of these samples gives no indication of subspecific differentiation. No adults were taken during the 1964 expedition but larvae were found on Santa Cruz Island in *Scalesia*.

Material examined. Santiago: 39 ♂♂, 16 ♀♀, December, 1905, January, 1906, all chopped from rotten logs (F. X. Williams); Santa Cruz: 3 ♂♂, Decem-

ber, 1905, January 11, 1906 (Williams); Isabela: 5 ♀♀, San Tomas, 1,200 ft., September, 1906 (Williams).

According to Williams (1926) larvae of the bethylid parasite, *Scleroderma galapagoensis* Brues, were found as external larval parasites on James Island, in December. The small wingless adults were also taken in the beetle borings.

Stenodontes molarius (Bates).

Mallodon molarium Bates, 1879, Biologia Centrali-Americana, Coleoptera, vol. 5, p. 9, pl. 1, figs. 1, 2.

Stenodontes (*Mallodon*) *molarius*, Lameere, 1902, Mem. Soc. Ent. Belgique, vol. 9, p. 74.

This robust species occurs from Mexico into South America. It may be distinguished from other species of *Stenodontes* (*Mallodon*) by the single-toothed genal process, the possession of a small terminal tooth at the base of the mandibular carina, the two internal teeth near the apex of the male mandibles, and the slightly curved antennal scape.

The species is presently known from the islands of Santa Cruz, Isabela, Santiago, San Cristóbal, Pinzón, and Floreana. At least three Galápagos subspecies may be recognized.

Stenodontes molarius galapagoensis Mutchler.

(Figures 3–8.)

Stenodontes (*Mallodon*) *galapagoensis* Mutchler, 1938, Amer. Mus. Nov., no. 981, p. 11, fig. 6.

Stenodontes (*Mallodon*) *molarius*, Mutchler, 1938, Amer. Mus. Nov., no. 981, p. 11 (records).

Stenodontes molarius, Van Dyke, 1953, Occ. Pap. Calif. Acad. Sci., no. 22, p. 129 (records).

This subspecies differs from the mainland populations by the more coarsely, confluently punctate head, the distinctly, sparsely punctate scutellum, the presence of small, scattered punctures over the elytra, and the less densely pubescent mandibles of the male. Length of males: 30–61 mm.; mandibles: 4–13 mm. Ratio of body length to mandible length in 43 specimens from 4 : 1 to 8 : 1 with a median ratio of 4.8 : 1.

The uniformly black color, usually elongate, slightly arcuate male mandibles, and more densely punctate scutellum and elytra will separate *S. m. galapagoensis* from other subspecies in the archipelago.

Galápagos distribution. Santa Cruz Island.

Flight period. January to July.

Host plants. *Piscidia erythrina, Hippomane macinella, Cieba pentandra, Scalesia pedunculata svensoni, Bursera graveolens, Ochroma lagopus.*

Material examined. Santa Cruz: Darwin Research Station: 1 ♀, January 21, 1964, at white light (R. L. Usinger); 1 ♂, 1♀, February 3, 1964 (R. O. Schuster); 1♀, February 6, at white light (G. Kuschel); 1 ♀, February 7,

FIGURES 1–4. Adults *in situ* (D. Q. Cavagnaro): figure 1, *Eburia lanigera* Linell, ♂; figure 2, *Desmiphora maculosa* Linsley and Chemsak, ♂; figure 3, *Stenodontes molarius galapagoensis* Mutchler, ♂; figure 4, same, ♀.

flying in late afternoon on heavily overcast day (E. G. Linsley): 1 ♂, 3 ♀♀, February 8 (Kuschel); 1 ♂, February 20 (Schuster); 1 ♂, 1 ♀, February 21, at white light (Linsley); Littoral Zone: 1 ♂, February 6, at white light (Linsley); Transition Zone, 160 meters above Academy Bay: 3 ♂♂, 2 ♀♀, February 4, under bark of *Piscidia erythrina* (Linsley); 4 ♂♂, 7 ♀♀, May 1 (D. Q. Cavagnaro); Moist Forest Zone, 240 meters above Academy Bay: 3 ♂♂, 2 ♀♀,

January 28–February 1 (Kuschel); Horneman Ranch: 3 ♂♂, 1 ♀, February 15 (Cavagnaro); 3 ♀♀, March 2 (Cavagnaro); 2 ♂♂, 3 ♀♀, March 10 (Cavagnaro); 1 ♂, March 19 (Cavagnaro); 1 ♂, March 25 (Cavagnaro); 1 ♂, April 11 (Cavagnaro); 1 ♂, 2 ♀♀, May 5 (Cavagnaro); 2 ♂♂, 1 ♀, May 7 (Cavagnaro); 3 ♂♂, 1 ♀, May 16 (Cavagnaro); 2 ♂♂, 3 ♀♀, June 1 (Cavagnaro); Upper NE. Slope 2,400 ft.: 2 ♂♂, April 10 (Cavagnaro); Table Mountain, 1,400 ft.: 4♂♂, 1 ♀, April 15 (Cavagnaro); 5 miles N. Academy Bay: 1 ♂, 1 ♀, February 8 (I. Wiggins); Santa Cruz Island: 2 ♂♂, 5 ♀♀, January 11, 1906 (F. X. Williams); 1 ♂, 2 ♀♀, July 1906 (Williams); 1 ♂, January 29, 1935 (W. von Hagen) (holotype).

Specimens examined in the collection of the Darwin Research Station: Darwin Research Station: 1 ♂, September 20, 1963 (D. Snow); 1 ♀, October 19, 1963 (D. Snow); 1 ♀, October 23, 1963 (D. Snow); 1 ♂, February 22, 1961 (R. Levêque); 2 ♂♂, March 13, 1961 (R. Levêque). Bella Vista Trail: 1 ♂, October 9, 1963, on trunks of balsa (D. Snow).

Stenodontes molarius vandykei Linsley and Chemsak, new subspecies.

Mallodon molarium, Linell, 1898, Proc. U. S. Nat. Mus., vol. 21, p. 259 (records).

Stenodontes molarius, Van Dyke, 1953, Occ. Pap. Calif. Acad. Sci., vol. 22, p. 129 (records).

Similar in form to *S. m. galapagoensis* but averaging smaller in size. Elytra usually dark brownish, paler than pronotum and head. Mandibles of males smaller with allometric development not pronounced. Head usually less coarsely, confluently punctate. Elytra and scutellum more sparsely punctate. Length of males: 34–53 mm.; mandibles: 3–8 mm. Ratio of body length to mandible length in eight specimens ranging from 6.6 : 1 to 11.3 : 1 with a median ratio of 8.4 : 1.

Holotype ♂ from Villamil, Albemarle Island (Isabela), March 22, 1906 (F. X. Williams); 5 ♂ paratypes with same data and 2 ♂♂, Albemarle, March 4, 1899.

We dedicate this subspecies to E. C. Van Dyke who first recorded the characteristics of this island population in his 1953 treatise on Galápagos Coleoptera.

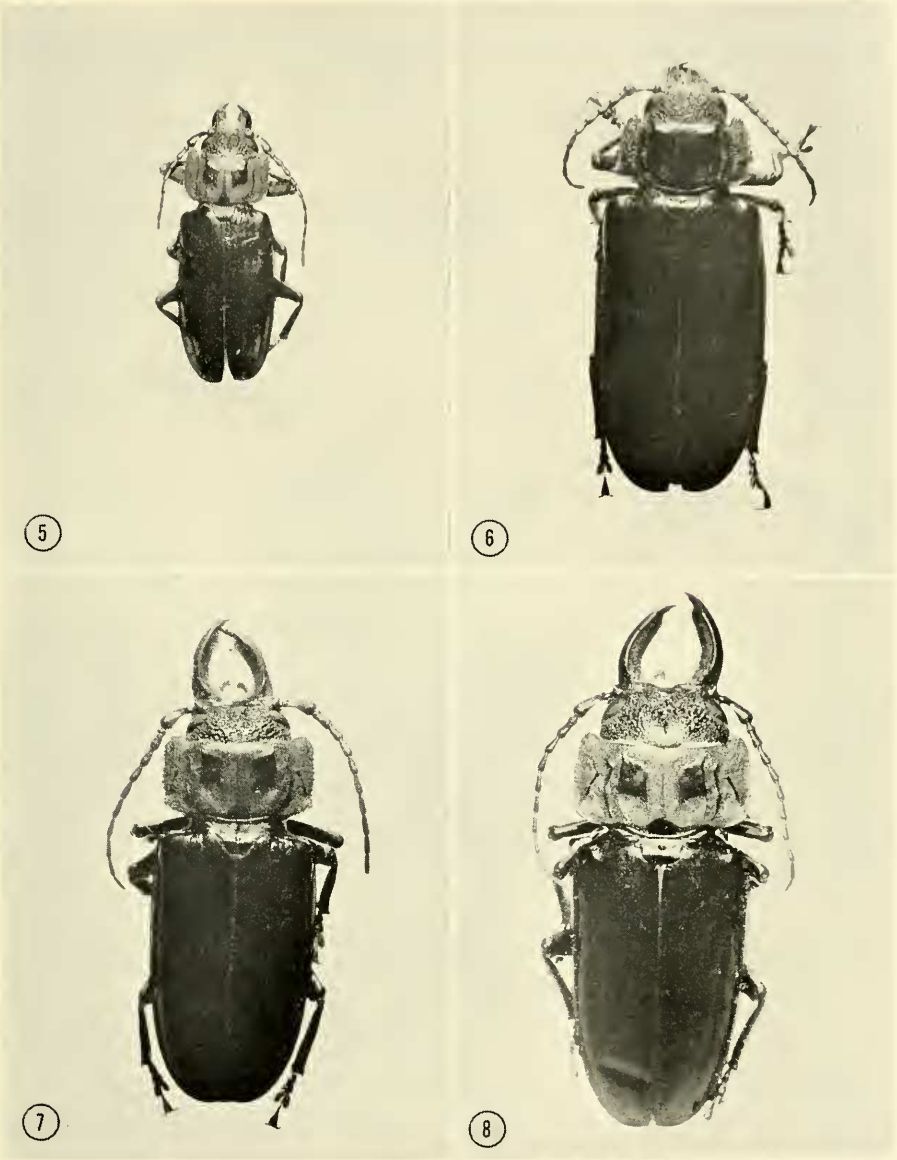
Stenodontes molarius glabratus Linsley and Chemsak, new subspecies.

Mallodon sp.? Howard, 1889, Proc. U. S. Nat. Mus., vol. 12, p. 191 (records).

Mallodon molarium, Linell, 1898, Proc. U. S. Nat. Mus., vol. 21, p. 259 (records).

Stenodontes moliarius, Mutchler, 1924, Zoologica, vol. 5, p. 238 (record).

Form, size, and coloration of *S. m. galapagoensis* but with a tendency to paler elytra. Mandibles of males with a lesser degree of allometric development than in *S. m. galapagoensis* but more than in *S. m. vandykei.* Head usually coarsely, confluently punctate. Elytra and scutellum almost impunctate. Length



Figures 5–8. Size variation of *Stenodontes molarius galapagoensis* Mutchler, with all figures about natural size. Figures 5, 7, and 8, ♂ ♂ ; figure 6, ♀.

of males: 31–57 mm.; mandibles: 4–12 mm. Ratio of body length to mandible length in seven specimens ranging from 4.8 : 1 to 7.7 : 1 with a median ratio of 5.8 : 1. Length of female: 43 mm.; mandibles, 4 mm.

Holotype ♂, allotype ♀ from Chatham Island (San Cristóbal), July, 1906, and January, 1906 (F. X. Williams); 5 ♂ paratypes, July, 1906, and January, 1906, from Chatham Island (Williams); one ♂ paratype, Baquerizo Morene, San Cristóbal Island, February 22, 1964 (R. L. Usinger).

Stenodontes molarius subspecies.

Material from other islands where this species is known to occur is either unavailable to us or too scanty to permit interpretations of relationships with the preceding populations. Available material consists of two specimens, one of each sex, from Santiago Island, NW. Slope, 300 M., May 30, 1964 (D. Q. Cavagnaro). These resemble examples from the Santa Cruz subspecies in coloration and punctation.

Other records include Duncan (Pinzón) Island (Howard, 1889) and Charles (Floreana) Island, Linell, 1898.

Strongylaspis kraepelini Lameere.

Strongylaspis (*Strongylaspis*) *Kräpelini* Lameere, 1903, Mem. Soc. Ent. Belgique, vol. 11, p. 28.

Strangylaspis (*Strongylaspis*) *kraepelini,* Lameere, 1919, Genera Insectorum (Wytsman), vol. 72, p. 25, pl. 2, fig. 4.

Size large, robust to small, dark reddish brown to fuscous. Head coarsely punctate; antennae extending slightly beyond middle of elytra in male, shorter in female, scape robust, up to 1½ times longer than third segment, third segment as long as the fourth and one-half of the fifth. Pronotum with disk opaque, asperate punctate except for large well defined Tau-shaped glabrous callus; sides acutely spined at base in female. Scutellum not heart-shaped, without a median groove, inflated dorsally and asperate. Elytra not pubescent, asperate punctate at base, opaque, apices often feebly dentate. Length, 16–33 mm.

Type locality. Guayaquil, Ecuador.

Range. Ecuador and Galápagos Islands (Santiago and Santa Cruz).

Flight period. December to May.

This distinctive species is known presently only from Ecuador and from two of the Galápagos Islands. The island populations are subspecifically distinct from the mainland forms in a number of characteristics.

Strongylaspis kraepelini kraepelini Lameere.

Strongylaspis (*Strongylaspis*) *Kräpelini* Lameere, 1903, Mem. Soc. Ent. Belgique, vol. 11, p. 28.

Strongylaspis (*Strongylaspis*) *kraepelini,* Lameere, 1919, Genera Insectorum (Wytsman), vol. 72, p. 25, pl. 2, fig. 4.

Size usually large, robust. Antennae with first segment about 1⅓ longer than third. Elytra densely asperate basally, than densely rugosely punctate. Scutellum

moderately inflated, rounded behind, rarely impressed apically. Prosternum finely asperate. Length, 22–33 mm.

Type locality. Guayaquil, Ecuador.

Range. Lowlands of Ecuador near Guayas River.

In addition to the type locality, this subspecies is known from Puna Island and Villa Rica.

Strongylaspis kraepelini parvula Linsley and Chemsak, new subspecies.
(Figures 10 and 12.)

Ground color brownish to dark reddish brown. Antennae with first segment about 1½ times longer than third. Elytra finely asperate punctate at base, opaque over basal one-third and down sides in males, punctures over remainder fine, well separated. Scutellum not greatly inflated, usually impressed and slightly emarginate at apex. Prosternum barely asperate, slightly shining. Length, 16–27 mm.

Holotype ♂, allotype ♀ and 3 ♂ paratypes from Moist Forest Zone, 240 meters above Academy Bay, Santa Cruz Island, January 28–February 1, 1964, at white light (G. Kuschel); additional paratypes from Horneman Ranch, 2 ♂♂, February 16, 1964 (D. Q. Cavagnaro); 1 ♂, March 2 (Cavagnaro); 2 ♀♀, March 10 (Cavagnaro); 1 ♂, March 19 (Cavagnaro); 1 ♂, March 25 (Cavagnaro); 1 ♂, 1 ♀, April 5 (Cavagnaro); 2 ♂♂, April 8 (Cavagnaro); 2 ♂♂, April 11 (Cavagnaro); 1 ♀, May 11 (Cavagnaro); 3 ♂♂, May 16 (Cavagnaro); 2 ♂♂, Table Mountain, 1,400 ft., April 15 (Cavagnaro).

The smaller average size, more finely punctate, nonrugose elytra and the proportions of the antennal segments will readily separate this subspecies from the typical form.

A number of larval instars, pupae and teneral adults were found in dead, rotting logs of *Scalesia pedunculata* at the higher elevations on Santa Cruz Island by D. Q. Cavagnaro.

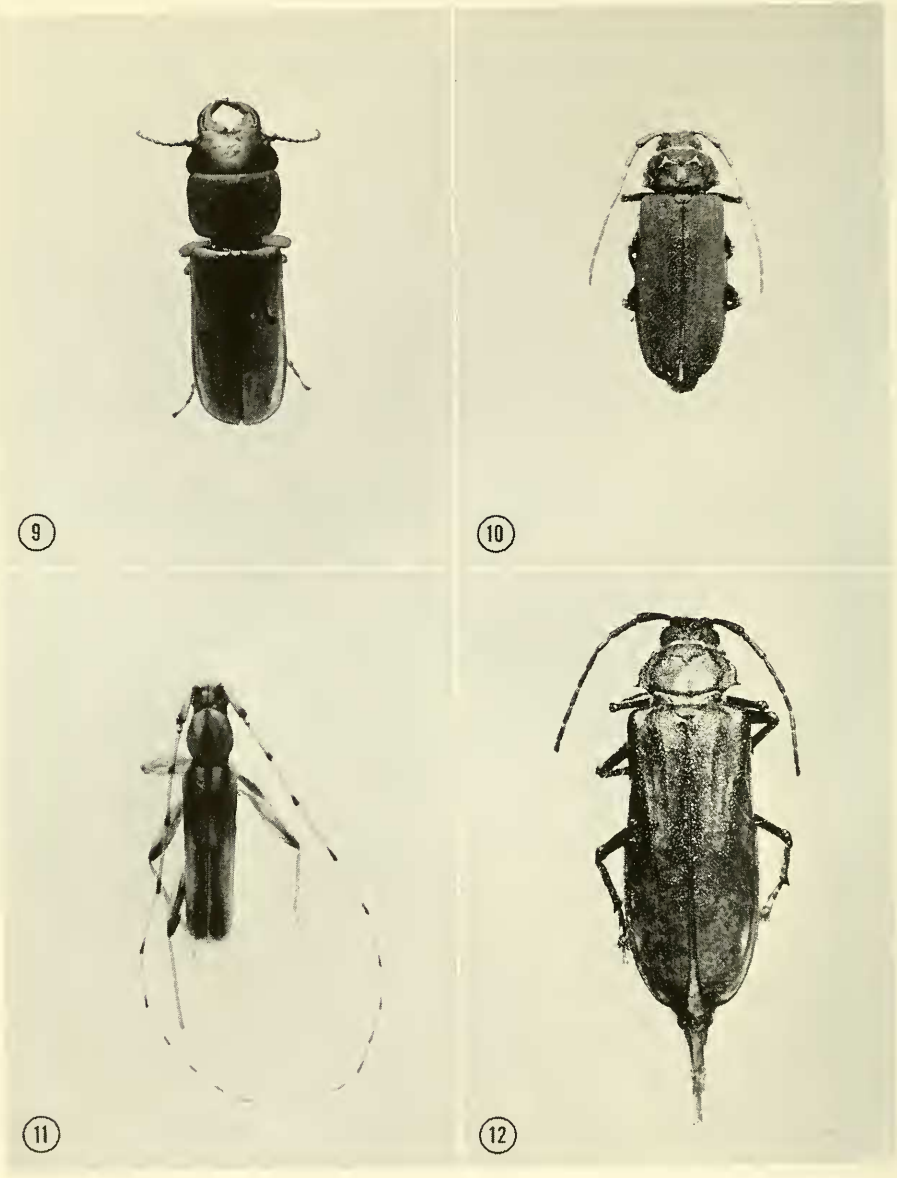
Strongylaspis kraepelini subspecies.

Strongylaspis kraepelini, Van Dyke, 1953, Occ. Pap. Calif. Acad. Sci., no. 22, p. 130, pl. 7, fig. 5.

Three females from James (Santiago) Island collected by F. X. Williams, December, 1905, average considerably larger than those collected on Santa Cruz Island. The larger size and paler coloration may be indicative of a distinct population, but the absence of males from this collection makes subspecific assignment impractical.

Nesoeme Linsley and Chemsak, new genus.

Form elongate, slender. Head moderate sized; eyes moderately deeply emarginate, lower lobe large, upper lobes widely separated above; genae small,



FIGURES 9–12. Figure 9, *Parandra galapagoensis* Van Dyke, ♂, × 1⅔; figure 10, *Strongylaspis kraepelini parvula* Linsley and Chemsak, ♂, × 1⅔; figure 11, *Nesoeme kuscheli*, Linsley and Chemsak, ♂, × 4; figure 12, *Strongylaspis kraepelini parvula* Linsley and Chemsak, ♀, × 1⅔.

mandibles small; maxillary palpi elongate, much longer than labial, apical segment obliquely truncate, not dilated; antennae 11-segmented, slender, scape gradually thickening apically, asperate near apex at outside, third segment slightly longer than first. Pronotum longer than broad, sides arcuate, broadest just behind middle, base not abruptly constricted, disk convex, shallowly impressed medially at apical one-half, surface subopague, minutely punctate; prosternal process absent, coxal cavities wide open behind, slightly angulate externally; mesosternal process absent, middle coxae contiguous. Elytra elongate, slightly tapering, sides slightly impressed at basal one-third; surface not costate; apices rounded. Legs with femora moderately clavate, tibiae slender, tarsi elongate. Abdomen normally segmented.

Type species. *Nesoeme kuscheli* Linsley and Chemsak, new species.

This genus may be distinguished from other Methiini by the elongate palpi, moderately deeply emarginate eyes, nonabruptly constricted pronotum, and absence of pro- and mesosternal processes. A single species is presently known.

Nesoeme kuscheli Linsley and Chemsak, new species.

(Figure 11.)

Male. Form narrow, elongate, elytra slightly tapering, sides moderately impressed before middle; color testaceous, pronotum at sides and middle, femora at apex and apex of antennal segments darker; pubescence fine, golden. Head about as wide as greatest width of pronotum; antennal tubercles broadly divergent on vertex, area between tubercles shallowly convex; eyes separated above by twice the diameter of antennal scape, more broadly beneath; front almost vertical, subopaque, minutely asperate punctate, pubescence sparse, short, subdepressed; neck behind eyes abruptly subparallel; antennae slender, extending five segments beyond body, segments darkly annulated apically, pubescence dense, suberect, slightly longer internally; scape slightly shorter than third segment, third shorter than fourth, fourth shorter than fifth, following segments gradually decreasing in length. Pronotum longer than wide, sides gradually rounded, broadest behind middle, base impressed, not abruptly constricted; disk convex, narrowly, shallowly impressed at middle on apical half, basal half with an elongate, narrow, glabrous, nonprominent callus; surface opaque, punctures vague, minute, pubescence short, fine, depressed; prosternum broad, impressed, finely punctate and transversely rugulose, prosternal process absent between coxae; mesosternum small, mesosternal process absent between coxae; metasternum asperate punctate and finely rugose; scutellum small, apically rounded, medially impressed, nonpubescent. Elytra over three times as long as broad, moderately tapering apically; each elytron with a dark vitta extending from base to almost apex, vittae coalescing at suture to enclose two pale elongate areas behind scutellum and two more before middle; punctures fine, sparse, surface opaque; each puncture bearing a short, suberect, recurved hair, hairs

longer at apex; apices rounded. Legs with femora moderately clavate, finely pubescent; first segment of hind tarsi longer than following segments together. Abdomen finely, shallowly punctate, moderately pubescent; apex of last sternite rounded, vaguely emarginate at middle. Length, 8 mm.

Holotype male from Darwin Research Station, Santa Cruz Island, January 23, 1964, at white light (G. Kuschel).

This species is dedicated to G. Kuschel who made intensive, successful efforts to collect Cerambycidae during the Expedition, and who generously made his captures available to us for study.

Achryson galapagoensis Linell.

Achryson galapagoensis Linell, 1898, Proc. U. S. Nat. Mus., vol. 21, p. 259; Van Dyke, 1953, Occ. Pap. Calif. Acad. Sci., no. 22, p. 131, pl. 7, fig. 6.

This species may be recognized by its testaceous ground color, the black markings of the pronotum and elytra and especially by the rounded nonelongate shape of the pronotum which is broader than long even in the male.

Individuals vary greatly in size, ranging in length from 10 to 22 mm. Of the material at hand from four islands, a sufficient series is represented from Santa Cruz, Floreana, and San Cristóbal islands to permit recognition of differences between the populations. The island of Baltra is represented by only two examples.

Van Dyke (1953) reports that this species occurs on the South American mainland in Peru, Chile, Colombia, and Ecuador. We have seen examples from Peru.

Achryson galapagoensis galapagoensis Linell.

Achryson galapagoensis Linell, 1898, Proc. U. S. Nat. Mus., vol. 21, p. 259; Van Dyke, 1953, Occ. Pap. Calif. Acad. Sci., no. 22, p. 131, pl. 7, fig. 6.

Ground color usually pale testaceous, head and pronotum darker, surface dull, not shining. Pubescence of elytra dense, subdepressed with longer suberect hairs abundantly interspersed. Pronotum of males opaque, small asperites numerous, females with surface slightly shining, punctures coarse, dense, subconfluent around irregular median callus. Elytra rather coarsely, contiguously punctate over basal one-third, larger males with sutural spines at apex. Length, 11–20 mm.

Type locality. Chatham Island (San Cristóbal).

Flight period. February to July.

Material examined. Chatham (San Cristóbal) Island: 4 ♂♂, 1 ♀, February 23, 1905 (F. X. Williams); 1 ♂, 1 ♀, July, 1906 (Williams); 1 ♂, 2 ♀♀, March 23, 1907 (Williams); 1 ♀, April 15, 1932 (M. Willows, Jr.).

Achryson galapagoensis flavescens Linsley and Chemsak, new subspecies.

Achryson galapagoensis, Van Dyke, 1953, Occ. Pap. Calif. Acad. Sci., no. 22, p. 131.

Ground color brownish testaceous, black markings of pronotum more numerous and larger than typical subspecies, elytra shining with black markings well defined. Elytra with pubescence short, recurved, longer suberect hairs absent; punctures over basal one-third moderately coarse, subcontiguous, apices usually with short tooth at suture. Length, 11–21 mm.

Holotype ♂ from Black Beach, Floreana Island, February 15, 1964, at white light (G. Kuschel); allotype ♀, Black Beach, February 18, 1964, at white light (E. G. Linsley); paratypes as follows: 2 ♀♀, Black Beach, February 14, 1964 (Linsley); 1 ♂, Black Beach, February 15, 1964 (Kuschel); 2 ♀♀, Floreana Island (M. Wittmer); 1 ♂, Charles (Floreana) Island, May 15, 1932 (M. Willows, Jr.). An additional ♀, October, 1963 (A. Leon) is in the collection of the Darwin Research Station.

This subspecies may be recognized by the absence of long suberect hairs on the elytra, its darker coloration, and the moderately coarse, subcontiguous punctures over the basal one-third of the elytra.

Achryson galapagoensis darwini Linsley and Chemsak, new subspecies.
(Figures 15 and 16.)

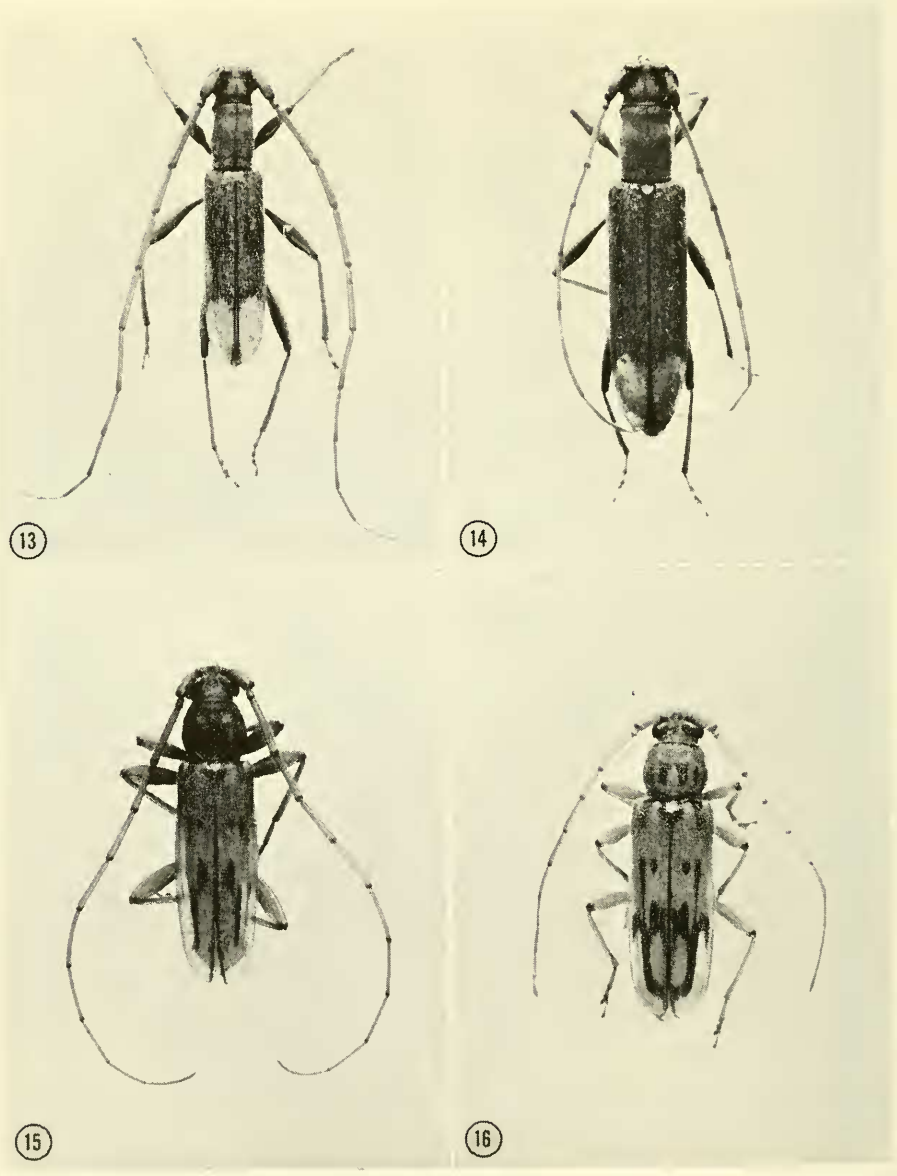
Ground color testaceous, black elytral markings distinct, pronotal dark bands not extensive, surface shining. Elytra with pubescence recurved, interspersed with longer suberect hairs; punctures over basal one-third small, well separated, apices with only a short sutural tooth even in the largest specimens. Length, 10–22 mm.

Holotype ♂ from Darwin Research Station, Academy Bay, Santa Cruz Island, January 25, 1964 (E. G. Linsley); allotype ♀, same data, February 21, 1964 (Linsley); paratypes (see table 3). Additional material includes 1 ♂, 1 ♀, Littoral Zone, Academy Bay, February 7 (E. G. Linsley, G. Kuschel); 1 ♂, Lower Slope, Santa Cruz Island, April 16, 1964 (D. Q. Cavagnaro).

The finer, less dense punctures, type of elytral pubescence and shining testaceous elytra will distinguish this subspecies from the others occurring on the Galápagos Islands.

Achryson galapagoensis subspecies.

One ♂ and one ♀ from South Seymour Island (Baltra) July, 1906 (F. X. Williams) appear to be distinct from known populations on other islands. The coloration and pubescence are similar to that of the Santa Cruz subspecies but the punctation of the elytra is more like that seen on Floreana. We have not assigned a name to this population because of insufficient material.



FIGURES 13–16. Figure 13, *Compsa apicalis* Blair, ♂, × 4; figure 14, same, ♀; figure 15, *Achryson galapagoensis darwini* Linsley and Chemsak, ♂, × 2; figure 16, same, ♀.

Table 3. *Samples of* Achryson galapagoensis darwini *collected at light at Darwin Research Station, Santa Cruz Island, 1964. All material paratypical (E. G. Linsley, G. Kuschel, I. Wiggins, D. Q. Cavagnaro, R. O. Schuster, collectors).*

January	♂	♀	*February*	♂	♀
20	7	13	1	2	7
21	3	3	2	5	3
22	2	–	4	4	4
23	2	2	5	5	4
24	2	3	6	6	5
25	1	1	7	7	16
27	1	3	9	2	1
28	1	3	10	2	4
29[1]	3	3	10–13	2	–
30	1	2	12	2	9
31	5	5	14	1	–
			15	7	2
			21	17	19
			23	1	1
			26	7	7

[1] 1 ♂, 1 ♀ taken in flight trap.

Eburia lanigera Linell.

(Figures 1, 17, and 18.)

Eburia amabilis Howard (*nec* Boheman), Proc. U. S. Nat. Mus., vol. 12, p. 192.

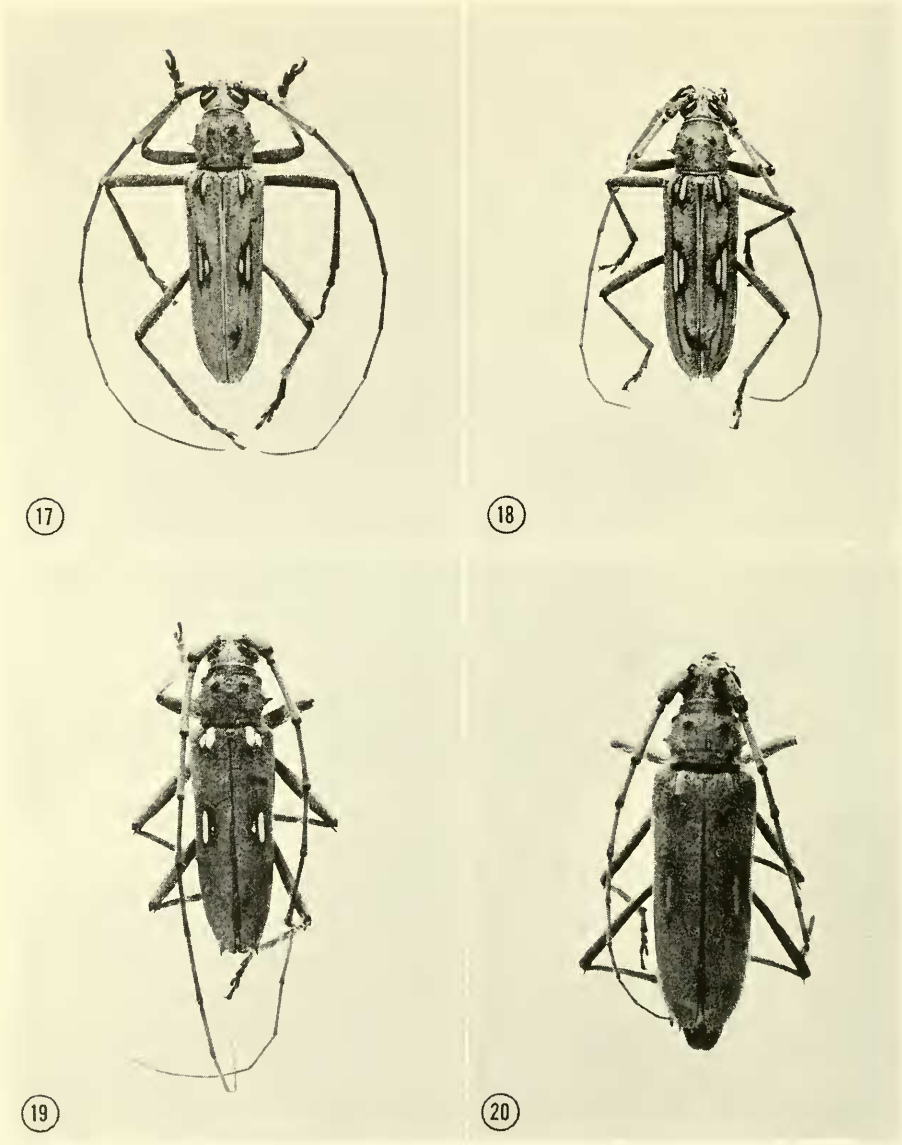
Eburia lanigera Linell, 1898, Proc. U. S. Nat. Mus., vol. 21, p. 259; Blair, 1933, Ann. Mag. Nat. Hist., ser. 10, vol. 11, p. 480 (= *E. stigma* var.); Mutchler, 1938, Amer. Mus. Novitates, no. 981, p. 12, fig. 5; Van Dyke, 1953, Occ. Pap. Calif. Acad. Sci., no. 22, p. 132.

Ground color reddish brown to reddish fuscous; pubescence dense, short, ashy, appressed, entirely covering surface except for eburneous ridges. Pronotum with acute lateral tubercles; disk with two acute glabrous, black tubercles before middle, two flat tubercles present at apex on sides and three small pubescent calluses, one median and two near sides behind middle; punctation shallow, rugose. Elytra usually with four eburneous ridges, two basal, inside pair longer, outer pair frequently absent, outside median pair longer, inside pair about as long as inside basal pair, ridges separated but contiguous with a few short recurved and longer erect hairs; apices moderately bispinose, outer spine slightly longer. Hind and middle femora with short spines, inner pair longer. Length, 10–23 mm.

Type locality: Charles (Floreana) Island.

Galápagos distribution: Pinta, Genovesa, Fernandina, Isabela, Santiago, Rábida, Pinzón, Santa Cruz, Santa Fé, San Cristóbal, Floreana, Española, and Gardner islands.

Flight period. November to May.



Figures 17–20. Figure 17, *Eburia lanigera* Linell, ♂, × 2; figure 18, same, ♀; figure 19, *Eburia proletaria* Erichson, ♂, × $1\frac{2}{3}$; figure 20, same, ♀.

Host plants. *Croton scouleri, Scalesia affinis, Scalesia pedunculata, Scalesia gummifera, Bursera graveolens.*

This species shows affinities with the West Indian and Central American *Eburia stigma* (Oliver) and Blair (1933) considered it to represent a variety

TABLE 4. *Samples of* Eburia lanigera *collected at light at Darwin Research Station, Santa Cruz Island, 1964. (D. Q. Cavagnaro, R. O. Schuster, E. G. Linsley, G. Kuschel, I. Wiggins, collectors).*

January	♂	♀	February	♂	♀	February	♂	♀
20	17	26	1	28	24	11	1	–
21	9	23	2	33	21	12	40	29
22	1	4	3	29	8	13	2	–
24	–	6	4	14	19	14	–	3
25	–	3	5	18	41	15	15	28
26	4	2	6[3]	33	48	18	–	3
27	3	15	7	10	21	19	3	2
28	1	3	8	1	–	20	–	1
29	6	17	9	10	12	21	3	15
30[2]	8	13	10	13	19	22	–	1
31	19	74	10/13	3	3	24	1	5

[2] 1 ♀ *ex Scalesia affinis.*
[3] 1 ♀ *ex Croton scouleri.*

of that species. However, the two are distinct, *E. lanigera* having a darker ground color, shorter elytral and femoral spines, and shorter, contiguous eburneous ridges of the elytra.

This is the most widely distributed species of Cerambycidae among the Galápagos Islands. It occurs on at least 13 of the 15 principal islands of the North-Central, Central, and Southern groups. It also appears to be one of the most structurally uniform from island to island. However, in the material available for study, populations on ten of the islands are represented by a total of only 43 specimens and while good series are included from Santa Cruz and Floreana islands, differentiation does not appear to have proceeded far enough to warrant their recognition as subspecies. The only evident comparative structural difference between the two is in the tendency toward loss of the outer pair of basal eburneous ridges. Among 285 individuals from Santa Cruz, 29 (ten per cent) lack the ridges. Among 83 Floreana specimens, 57 (68 per cent) have this pair of ridges missing. Although these samples are significantly different in this feature, larger series from the other islands are needed before they can be evaluated.

MATERIAL EXAMINED. Santa Cruz Island, Darwin Research Station: see summary in table 4; Littoral Zone, Academy Bay: 2 ♀♀, February 7, at white light (E. G. Linsley, G. Kuschel); Upper Arid Zone, 100 meters above Academy Bay: 1 ♂, 1 ♀, January 23, *ex Scalesia affinis* (E. G. Linsley, R. L. Usinger); 1 ♂, January 24, *ex Scalesia affinis* (Linsley); Moist Forest Zone, 240 meters above Academy Bay: 3 ♂♂, 1 ♀, January 28–February 1, at white light (Kuschel); 1 ♂, February 23, *ex Scalesia pedunculata* (Linsley); Horneman Ranch: 1 ♀, February 15 (D. Q. Cavagnaro); 2 ♂♂, 5 ♀♀, March 2 (Cava-

gnaro); 1 ♂, 1 ♀, March 30 (Cavagnaro); 2 ♂♂, April 5 (Cavagnaro); 1 ♂, May 3 (Cavagnaro); Table Mountain, 1,400 ft.: 3 ♀♀, April 14 (Cavagnaro); Lower East Slope: 1 ♂, April 16 (Cavagnaro).

Specimens examined in the collection of the Darwin Research Station: Darwin Research Station: 1 ♂, September 5, 1963, at light (D. Snow); 1 ♂, October 19, 1963, at light (D. Snow). Academy Bay: 1 ♀, December 18, 1963, at light (D. Snow); 1 ♂, March, 1960 (R. Levêque).

Floreana Island, Black Beach: 15 ♂♂, 11 ♀♀, February 14, 1964, at white light and *ex Scalesia affinis* (Linsley); 9 ♂♂, 10 ♀♀, February 15, at white light (Kuschel); 6 ♂♂, 8 ♀♀, February 18, at white light (Linsley); Moist Forest, 300 meters above Black Beach: 5 ♂♂, 10 ♀♀, February 14, at white light (Kuschel); Floreana Island: 4 ♀♀, February 6 (C. B. Koford); 1 ♂, 4 ♀♀ (M. Wittmer).

Pinta Island: 1 ♂, 1 ♀, South Coast, May 25, 1964 (Cavagnaro).

Genovesa Island: 2 ♂♂, 3 ♀♀, Darwin Bay, January 30, 1964, at white light (A. Smith); 1 ♀, March 25, 1961 (R. Levêque, in coll. D.R.S.).

Fernandina Island: 1 ♂, Punta Espinosa, January 29, 1964 (Usinger); 1 ♂ 1 ♀, West Side, 1,100 ft., February 5, 1964 (Cavagnaro).

Isabela Island: 1 ♂, Tagus Cove, January 30, 1964, *ex Scalesia gummifera* (Usinger); 1 ♀, December, 1905 (F. X. Williams); 1 ♀, April 10, 1906 (Williams); 1 ♀, January 28, 1899; 1 ♀, March 11, 1899.

Santiago Island: 1 specimen recorded by Blair (1933).

Rábida Island: 2 ♂♂, 2 ♀♀, December 18, 1905 (Williams).

Pinzón Island: 1 ♀, February 7, 1964 (Cavagnaro); 3 ♂♂, December, 1905 (Williams).

Santa Fé Island: 2 ♀♀, February 5, 1964 (T. Pappenfuss).

San Cristóbal Island: 2 ♂♂, 3 ♀♀, Baquerizo Morene, February 22, 1964 (Usinger); 1 ♂, 3 ♀♀, February, 1906 (Williams).

Española Island: 2 ♂♂, 4 ♀♀, Punta Suarez, February 12, 1964, at white light (Linsley); 1 ♀, November, 1905 (Williams).

Gardner Island: 1 ♂, 1 ♀, January 1906 (Williams).

Blair (1933) also records one specimen from Eden Island.

Eburia proletaria Erichson.

(Figures 19 and 20.)

Eburia proletaria Erichson, 1847, Archiv für Naturgesch., vol. 1, p. 140; Blair, 1935, Ann. Mag. Nat. Hist., ser. 10, vol. 6, p. 481; Van Dyke, 1953, Occ. Pap. Calif. Acad. Sci., no. 22, p. 132.

Eburia bauri Linell, 1898, Proc. U. S. Nat. Mus., vol. 21, no. 1143, p. 260.

Color reddish brown; pale pubescence short, dense, appressed with long erect flying hairs numerous. Antennae with basal segments densely clothed with long erect hairs internally. Pronotum acutely spined at sides, disk with black

tubercles on dorsum and at sides behind apex, surface coarsely, rugosely punctate. Elytra with pubescent eburneous ridges, two basal pairs (inside pair longer) and two median pairs, outside pair elongate, inside pair often greatly reduced; base densely asperate punctate; apices moderately bispinose, outer pair more prominent. Femoral spines of moderate length. Length, 20–28 mm.

Type locality. Of *E. proletaria*, Peru; *E. bauri,* Chatham (San Cristóbal) Island, Galápagos Archipelago.

Galápagos distribution. San Cristóbal, Isabela, and Santiago islands.

Although we have not seen representatives of this species from the South American mainland, Van Dyke (1953) records large series in the British Museum from Ecuador, Colombia, Peru, Bolivia, and Chile. The pale ground color and less dense pubescence will readily separate *E. proletaria* from *E. lanigera.*

Material examined. 1 ♀, Santiago Island, December, 1905 (F. X. Williams); 1 ♂, San Cristóbal Island, February 25, 1906 (Williams); 1 ♂, San Cristóbal Island, February, 1906 (Williams); 2 ♂♂, 3 ♀♀, San Cristóbal Island (Baur); 1 ♀, Galápagos Islands, emerged on July 21, 1914, from wood collected by Williams.

We have followed Van Dyke (1953) in treating *E. bauri* as a synonym of *E. proletaria,* since we have not seen the type of the latter nor have we had mainland series available for comparison. Material of both sexes before us from Isabela and Santiago islands agrees well with the female associated by Linell with the male type. However, both males in the type series differ markedly in having smaller eburneous ridges on the elytra with the outer basal pair longer that the inner pair and the outer median pair only as long as the outer basal pair or slightly longer. Further, the apical area of the elytra lacks long suberect hairs, the sutural angle of the elytral apices is rounded, not spinose, and the femoral spines are very short. Presumably these characters are expressions of intraspecific variation, but a remote possibility exists that two species are involved.

As suggested earlier, this species may have been introduced by man, since members of this genus are notoriously long-lived in finished lumber. If so, this would lend credence to the above synonymy. In spite of its large size and presumed susceptibility to attraction to lights, it has been found on only three of the islands—a marked contrast to the situation with *Eburia lanigera.*

Compsa apicalis Blair.

(Figures 13 and 14.)

Compsa apicalis Blair, 1933, Ann. Mag. Nat. Hist., ser. 10, vol. 11, p. 481.

A narrow reddish brown species clothed with very short yellowish appressed pubescence which does not conceal the surface. The elongate cylindrical pronotum possesses a moderately elevated, median glabrous callus. The elytra are

sparsely apically asperate punctate with each puncture giving rise to a long suberect seta, more numerous at apex. Each elytron is strongly costate medially and the apices are broadly pale. A short oblique pale fascia is usually present also at the basal one-third of each elytron. Length, 7–12 mm.

Type locality. James Island (Santiago).

Galápagos distribution. Santiago and Santa Cruz islands.

Flight period. January and February.

Host plant. *Avicennia officinalis*.

We have not seen specimens from islands other than Santa Cruz. Since Blair's original description is not detailed enough to permit subspecific analysis, we have treated the species as monotypic.

Material examined. Santa Cruz Island, Littoral Zone, Academy Bay; 9 ♂♂, 5 ♀♀, February 6, 1964, at white light (E. G. Linsley); 7 ♂♂, 1 ♀, February 7 (Linsley); Darwin Research Station, Academy Bay; 2 ♂♂, 1 ♀, January 26 on dead branches of *Avicennia officinalis* (G. Kuschel); 2 ♂♂, February 21 and 23 on dead branches of *Avicennia officinalis* (Kuschel).

The affinities of *C. apicalis* appear to be with the mainland. Blair (1933) lists two specimens probably of this species from "New Grenada."

Desmiphora maculosa Linsley and Chemsak, new species.
(Figures 2 and 27.)

Desmiphora hirticollis (*non* Olivier, 1795) Blair, 1933, Ann. Mag. Nat. Hist., vol. 11, no. 10, p. 482 (Galápagos record).

Male. Form moderate sized, stout; ground color piceous, pubescence dense, appressed, brownish, mottled, with ashy, long erect hairs numerous, large bicolored erect tufts present at apex of pronotum and at apical one-third of elytra. Head oblique, short; front finely, moderately densely punctate, vertex convex, punctures similar to front; pubescence dense, obscuring surface, brownish with patches of white interspersed, long white erect hairs numerous, a small erect tuft of white and brown hairs present on vertex at middle; antennae extending to apical one-third of elytra, densely clothed with short appressed brown and white pubescence, long erect flying hairs numerous, especially along inside, scape stout, subequal in length to fourth segment, third longer than fourth, fourth longer than fifth, sixth to eleventh gradually decreasing in length. Pronotum broader across lateral tubercles than long, sides diverging to form large, median blunt-tipped, slightly backward directed spine; apex with a large median tuft of brown and white erect hairs, two elevated elongate tubercles present near apex one on each side of hair tuft, tubercles bearing thin tufts; disk with a median, elongate glabrous callus, punctures coarse, well separated, denser toward sides; pubescence dense, brownish with white mottling, two oblique white stripes extending from apical calluses to humeri, additionally an eyelike pale circle present on each side near apex, white erect hairs numerous; prosternum narrow, proster-

nal process vertical in front, plane between coxae, then abruptly declivous behind, plane area ridged before and behind, apex expanded, coxal cavities closed; mesosternal process vertical in front with a small glabrous callus present medially; sterna densely brown and white pubescent with long erect hairs numerous. Elytra over twice as long as broad, tapering slightly; each elytron with an elevated subsutural costa extending from base almost to apex; basal punctures coarse, contiguous, each puncture asperate at apex, punctures becoming less numerous and nonasperate toward apex; pubescence appressed, brownish, densely mixed with white patches especially behind basal one-third, white hairs forming a faint v-shaped macula at basal one-third, thick long erect tufts of brown and white hairs present outside of costae at apical one-third, thin pale lines of long erect hairs usually extending laterally forward from anterior edge of large tufts, long erect and suberect flying hairs numerous; apices rounded. Legs short, stout; femora brown and white pubescent, black spotted, flying hairs abundant. Abdomen densely clothed with brown and white appressed pubescence, black spotted, flying hairs numerous; fifth sternite elongate, apex rounded, densely setose; apex of fifth tergite rounded. Length, 11–15 mm.

Female. Antennae slightly shorter; fifth abdominal sternite shallow impressed at middle, apex emarginate; apex of fifth tergite emarginate.

Holotype ♂, allotype ♀ from Darwin Research Station, Santa Cruz Island, January 20, 1964, at white light (E. G. Linsley); paratypes as follows: Darwin Research Station; 1 ♂, September 4, 1963 (P. Leon, D. Snow); 1 ♀, September 21, 1963 (D. Snow, P. Leon); 1 ♂, 1 ♀, January 20, 1964, at white light (Linsley); 1 ♀, January 21 (R. O. Schuster); 1 ♀, January 27, at white light (Linsley); 1 ♂, January 31, at white light (Linsley); 1 ♀, February 2, at white light (Linsley); 1 ♀, February 3, at white light (Schuster); 1 ♂, February 9 (Schuster); 1 ♂, 1 ♀, February 21, at white light (Linsley, G. Kuschel); 1 ♂, June 13, 1964 (D. Q. Cavagnaro); Horneman Ranch; 2 ♂♂, May 7, 1964 (Cavagnaro).

Also assignable to this species but not designated as paratypical is one ♂, S. W. Fernandina Island, February 5, 1964, *ex Scalesia cordata* (P. D. Ashlock). Blair (1933) recorded this species (as *D. hirticollis*) from James (Santiago) Island.

The single stripes of the pronotum, differently oriented elytral tufts, and different coloration will separate *D. maculosa* from *Desmiphora hirticollis* (Olivier).

Estoloides galapagoensis (Blair).

(Figures 22 and 24.)

Estola galapagoensis Blair, 1933, Ann. Mag. Nat. Hist., ser. 10, vol. 11, p. 482; Van Dyke, 1953, Occ. Pap. Calif. Acad. Sci., no. 22, p. 134, pl. 7, fig. 4.

Estoloides galapagoensis, Breuning, 1940, Folia Zool. Hydrobiol., vol. 10, p. 75.

FIGURES 21–24. Figure 21, *Acanthoderes galapagoensis vonhageni* Mutchler, ♂, × 3⅓; figure 22, *Estoloides galapagoensis* (Blair), ♂, × 2; figure 23, *Acanthoderes galapagoensis vonhageni*, ♀, × 2⅔; figure 24, *Estoloides galapagoensis*, ♀, × 3⅓.

A relatively large reddish brown to dark brownish species. The body is densely clothed with short recumbent grayish to grayish brown pubescence. The dense pubescence is irregular giving a somewhat mottled appearance. The prono-

tum has a narrow glabrous median callus and large punctures irregularly scattered over the surface. The elytra are densely, coarsely punctate at the base with the punctures becoming finer and less numerous apically. Each puncture bears a short recurved seta. The antennae are narrowly annulate at the base of each segment and on the male, extend about four segments beyond the body. Length, 10–19 mm.

TYPE LOCALITY. James Island (Santiago).

RANGE. Santiago, Isabela, Santa Fé, and Santa Cruz Islands.

FLIGHT PERIOD. September to April.

HOST PLANTS. *Bursera graveolens, Scalesia gummifera, Scalesia affinis.*

Although a large series of specimens is available from Santa Cruz Island, samples from other islands (one from Santa Fé and eight from Isabela) are too small to reveal population differences or trends if they exist.

Blair (1933) considered this species to be allied to the Central American *E. perforata* (Bates) but differing in punctation, appearance, and pubescence.

MATERIAL EXAMINED. Santa Fé Island; 1 ♂, February 20, 1964, *ex Bursera graveolens* (E. G. Linsley): Isabela Island; 2 ♂♂, 3 ♀♀, Tagus Cove, January 30, 1964, *ex Scalesia gummifera* (R. L. Usinger); 1 ♀, December, 1905 (F. X. Williams); 1 ♂, 1♀, San Tomas, September, 1905 (Williams): Santa Cruz Island; Darwin Research Station (at light); 3 ♂♂, 1 ♀, September 6, 14, 17, 1963 (D. Snow, P. Leon); 4 ♂♂, 6 ♀♀, January 20, 1964 (Linsley); 2 ♂♂, 2 ♀♀, January 21 (R. O. Schuster, G. Kuschel); 1 ♀, January 22 (R. O. Schuster and D. Q. Cavagnaro); 1 ♂, January 22, *ex Scalesia affinis* (P. D. Ashlock); 1 ♂, 3 ♀♀, January 24 (Linsley); 2 ♀♀, January 26 (Schuster, Linsley); 1 ♂, 1 ♀, January 27 (Linsley, Schuster and Cavagnaro); 2 ♂♂, 4 ♀♀, January (Linsley, Schuster); 14 ♂♂, 10 ♀♀, January 30, at light (Schuster) and *ex Scalesia affinis* (Linsley); 2 ♂♂, 3 ♀♀, January 31 (Linsley, Schuster); 5 ♂♂, 4 ♀♀, February 1 (Linsley, Schuster); 6 ♂♂, 3 ♀♀, February 2 (Linsley, Schuster); 6 ♂♂, 3 ♀♀, February 3 (Schuster); 4 ♂♂, 7 ♀♀, February 4 (Linsley, Schuster); 3 ♂♂, 2 ♀♀, February 5 (Schuster); 3 ♂♂, 5 ♀♀, February 6 (Kuschel, Linsley, Schuster); 1 ♂, February 8, flying in late afternoon (Linsley); 2 ♂♂, 1 ♀, February 9 (Schuster and Cavagnaro, Linsley); 2 ♀♀, February 10 (Linsley, Schuster); 1 ♂, 1 ♀, February 10–13 (I. Wiggins); 3 ♂♂, 2 ♀♀, February 12 (Schuster and Cavagnaro); 3 ♂♂, February 15 (Wiggins); 1 ♂, 1 ♀, February 19 (Schuster); 7 ♂♂, 1 ♀, February 21 (Linsley); 1 ♀, February 23 (Kuschel); 3 ♀♀, February 26 (Linsley): Littoral Zone, Academy Bay; 1 ♀, February 7 (Kuschel): Upper Arid Zone, 100 meters above Academy Bay; 4 ♂♂, 2 ♀♀, January 23, *ex Scalesia affinis* (Linsley, Usinger); 4 ♂♂, 9 ♀♀, January 28, *ex Scalesia affinis* (Linsley): Moist Forest Zone, 240 meters above Academy Bay; 3 ♂♂,

2 ♀♀, February 12, *ex Scalesia* (Schuster and Cavagnaro): Lower East Slope; 5 ♂♂, April 16 (Cavagnaro). 1 km. N. Academy Bay: 1 ♂, 2 ♀♀, August 23, 1963 (D. Snow, P. Leon): Bella Vista Trail: 1 ♂, September 4, 1963, in *Scalesia* (D. Snow, P. Leon).

Additionally, Blair (1933) lists four specimens from James (Santiago) Island and one from Indefatigable (Santa Cruz Island).

Extreme larval work was found in dead wood of *Bursera graveolens* on Santa Fé Island on February 21, 1964. The larvae feed under the bark, completely loosening it. The galleries are tightly packed with coarse fibrous frass like that of *Monochamus*. The feeding area includes the main trunk (approximately 5 inches in diameter) and branches down to about 1½ inches in diameter. The larvae eventually bore into the solid heartwood and sapwood. Emergence holes are oval, usually angled.

Acanthoderes galapagoensis Linell.

Acanthoderes galapagoensis Linell, 1898, Proc. U. S. Nat. Mus., vol. 21, p. 261.

This species is characterized by its brownish to fuscous ground color, ashy to black depressed pubescence, and dark elytral bands. The punctation is moderate and not dense and the short erect hairs of the elytra are not numerous. The antennae are of moderate length and brownish and ashy annulated. Additionally, the elytral apices are emarginate with usually a short spine or tooth at the outside margins. Length, 9–17 mm.

Type locality. Chatham Island (San Cristóbal).

This apparently endemic species is presently known from four of the Galápagos Islands: San Cristóbal, Santa Cruz, Santiago, and Isabela. Judging from the original description and from material at hand, it segregates into distinctive subspecific populations on the various islands.

Linell (1898) commented that this species greatly resembles the Brazilian *A. lateralis* Bates in form, structure, and coloration.

Acanthoderes galapagoensis galapagoensis Linell.

Acanthoderes galapagoensis Linell, 1898, Proc. U. S. Nat. Mus., vol. 21, p. 261.

Ground color brownish, pubescence ashy gray with lighter and darker brown maculations. Elytra with granules in front of punctures over basal one-half; apices with spine at outside margin. Legs with posterior tarsi long and slender, first segment as long as three following together. Length 14–16 mm.

Type locality. Chatham Island (San Cristóbal).

Although we have not examined specimens from this island, the above characteristics taken from the original description indicate that the San Cristóbal population is distinct from those of other islands.

Acanthoderes galapagoensis vonhageni Mutchler.

(Figures 21 and 23.)

Acanthoderes galapagoensis var. *vonhageni* Mutchler, 1938, Amer. Mus. Nov., no. 981, p. 14.

Ground color brownish to fuscous, pubescence brownish ashy with brown to black maculations. Head with front deeply, distinctly punctate, punctures numerous. Elytra with basal punctures not possessing granules anteriorly, short suberect hairs numerous; apices with at most a short blunt tooth at outside margin. Legs with first segment of posterior tarsi not as long as three following segments together. Length, 9–17 mm.

Type locality. Indefatigable Island (Santa Cruz).

Flight period. January to October.

Host plant. *Scalesia pedunculata.*

Mutchler (1938) thought the material he had from Santa Cruz Island was sufficiently distinct to warrant at least a varietal name. Besides the lack of elytral granules and shorter first segment of the posterior tarsi, this subspecies differs from the typical form by possessing longer suberect elytral hairs, less produced spine at the apical outer margin of the elytra, and slightly different elytral markings.

Material examined. Darwin Research Station; 1 ♀, January 20, 1964, at white light (R. L. Usinger); 1 ♀, January 21, at light (R. O. Schuster); 1 ♂, January 28, at light (Schuster); 1 ♀, January 29, at light (Schuster); 1 ♂, February 1, 1964, at white light (E. G. Linsley); 2 ♂♂, February 4, at light (Schuster); 1 ♀, February 5, at light (Schuster); 1 ♀, February 6, at white light (G. Kuschel); 1 ♀, February 7, at light (Schuster); 1 ♀, February 12, at light (Schuster and D. Cavagnaro); 1 ♀, February 16 (Schuster); Littoral Zone, Academy Bay; 1 ♂, 1 ♀, February 7, at white light (Kuschel, Linsley); Moist Forest Zone, 240 meters above Academy Bay; 7 ♂♂, 5 ♀♀, January 28–February 1, at white light (Kuschel); 1 ♂, 1 ♀, February 1, *ex Scalesia pedunculata* (Kuschel); 1 ♂, 1 ♀, February 13, *ex Scalesia pedunculata* (Linsley); 1 ♀, February 28, *ex Scalesia pedunculata* (Linsley); Horneman Ranch; 3 ♂♂, 2 ♀♀, February 15 (Cavagnaro); 11 ♂♂, 3 ♀♀, March 2, 1964 (Cavagnaro); 3 ♂♂, 2 ♀♀, March 10 (Cavagnaro); 1 ♂, March 11 (Cavagnaro); 2 ♂♂, March 30 (Cavagnaro); 1 ♂, April 2, 1964 (Cavagnaro); 4 ♂♂, 4 ♀♀, April 5 (Cavagnaro); 5 ♂♂, 2 ♀♀, April 8 (Cavagnaro); 8 ♂♂, 2 ♀♀, May 3, 1964 (Cavagnaro); 6 ♂♂, 1 ♀, May 7 (Cavagnaro); 1 ♂, 1 ♀, May 16 (Cavagnaro); Table Mountain, 1,400 feet; 2 ♂♂, 1 ♀, April 14 (Cavagnaro).

Specimens examined in the collection of the Darwin Research Station: Darwin Research Station: 3 ♂♂, 1 ♀, September 14, 1963, at light (D. Snow); Bella Vista Trail: 1 ♂, October 3, 1963, at light (D. Snow).

Acanthoderes galapagoensis williamsi Linsley and Chemsak, new subspecies.

Acanthoderes galapagoensis, Van Dyke, 1953, Occ. Pap. Calif. Acad. Sci., no. 22, p. 136.

Ground color reddish brown, appressed pubescence brownish, suffused with

ashy and darker brown, maculations blackish. Head with front containing only a few punctures. Elytra sparsely granulate at base, suberect hairs short; apices bluntly toothed at outer margin. Legs with first segment of posterior tarsi shorter than following segments together. Length, 13–16 mm.

Holotype ♂, allotype ♀ from James Island (Santiago), January, 1906 (F. X. Williams); paratypes as follows: 2 ♀♀, James Island, January, 1906 (Williams); 2 ♀♀, James Island, March 2, 1906 (Williams).

The paler ground color and pubescence and much less densely punctate front of the head distinguish this subspecies from the Santa Cruz population (*A. g. vonhageni*). The length of the hind tarsi and shorter elytral spines will separate it from the nomino-typical form from San Cristóbal.

Acanthoderes galapagoensis subspecies.

Acanthoderes galapagoensis, Van Dyke, 1953, Occ. Pap. Calif. Acad. Sci., no. 22, p. 136.

The two specimens available from Albemarle Island (Isabela) suggest that this population may have a more uniform brownish pubescence, reduced black maculae, and longer suberect hairs on the elytra. Also, the front of the head has moderately numerous punctures. However, more material is needed before these indications can be evaluated. 1 ♂, Villamil, S. Albemarle Island, August 20, 1906 (F. X. Williams); 1 ♂, Albemarle, March 4, 1906 (Williams).

Estola insularis Blair.

Estola insularis Blair, 1933, Ann. Mag. Nat. Hist., ser. 10, vol. 11, p. 483.

Ground color brownish to fuscous, short depressed pubescence ashy or rufous to fuscous, often suffused with grayish patches to give a maculated appearance; longer suberect hairs pale. Pronotum with acute lateral tubercles behind middle, disk convex, densely punctate. Elytra with coarse punctures arranged in longitudinal rows, apices rounded. Underside coarsely, densely punctate. Antennae annulate. Length, 5–11 mm.

Type locality. Indefatigable (Santa Cruz) Island.

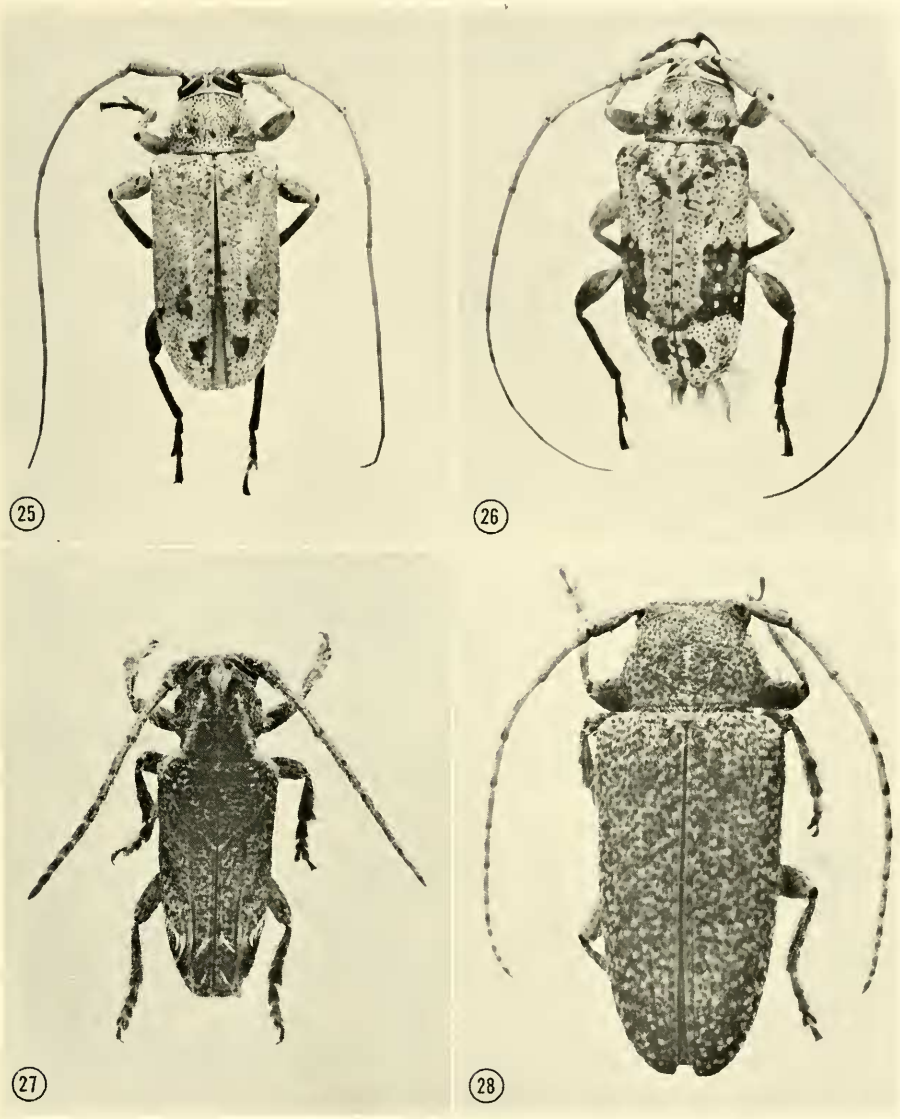
Estola insularis has been found on seven islands: Santa Cruz, Isabela, Santa Fé, Fernandina, Floreana, Pinzón, and Santiago. So far as can be determined, the species is exclusively attached to plants of the endemic genus of tree composites, *Scalesia*. Our series reveals considerable difference among the populations of the various islands.

The affinities of *E. insularis* appear to be with Central America. According to Blair (1933), it most closely resembles *E. miscella* Bates.

Estola insularis insularis Blair.

(Figure 28.)

Estola insularis Blair, 1933, Ann. Mag. Nat. Hist., ser. 10, vol. 11, p. 483; Van Dyke, 1953, Occ. Pap. Calif. Acad. Sci., no. 22, p. 135 (record).



Figures 25–28. Figure 25, *Nesozineus galapagoensis variabilis* Linsley and Chemsak, ♀, ×5⅓; figure 26, same, ♂; figure 27, *Desmiphora maculosa* Linsley and Chemsak, ♂, × 3⅓; figure 28, *Estola insularis* Blair, ♀, × 6⅔.

Ground color usually dark reddish brown; recumbent pubescence ashy and brownish, pale hairs forming spots to give mottled appearance; pale subdepressed, recurved hairs fairly long. Disk of pronotum with punctures subcontiguous, lateral tubercles prominent. Length, 5–11 mm.

Type locality. Santa Cruz Island.

Flight period. January to May.

Host plants. *Scalesia affinis, S. pedunculata svensoni, S. helleri.*

This subspecies may be recognized by the condensed patches of grayish pubescence over the elytra which present a mottled appearance. The size range in the series at hand is appreciable.

Material examined. Santa Cruz Island: Darwin Research Station: 6 ♂♂, 2 ♀♀, January 22, 1964, *ex Scalesia affinis* (P. D. Ashlock); 5 ♂♂, 3 ♀♀, January 23, beating *Scalesia affinis* and at white light (G. Kuschel); 4 ♂♂, 1 ♀, January 26, *ex Scalesia affinis* (Kuschel, R. L. Usinger); 3 ♂♂, 2 ♀♀, January 30, *ex Scalesia affinis* (E. G. Linsley); 1 ♀, February 4 (R. O. Schuster). Upper Arid Zone, 100 meters above Academy Bay: 16 ♂♂, 10 ♀♀, January 23, *ex Scalesia affinis* (Ashlock, Linsley, Usinger); 3 ♂♂, 4 ♀♀, January 24, *ex Scalesia affinis* (Linsley); 8 ♂♂, 10 ♀♀, January 28, *ex Scalesia affinis* (Linsley). Moist Forest Zone, 240 meters above Acadamy Bay; 2 ♂♂, 3 ♀♀, January 23, *ex Scalesia pedunculata* (Ashlock); 1 ♂, 1 ♀, January 28–February 1, at white light (Kuschel); 2 ♂♂, 1 ♀, February 12, *ex Scalesia* (Schuster and D. Q. Cavagnaro). Horneman Farm: 1 ♀, March 25 (Cavagnaro); 1 ♂, May 7 (Cavagnaro); 1 ♀, May 11 (Cavagnaro); 1 ♂, 1 ♀, May 16 (Cavagnaro). Table Mountain, 1,400 feet: 2 ♂♂, 1 ♀, April 14 (Cavagnaro). 1 mile E. Tortuga Bay: 2 ♂♂, 2 ♀♀, February 17, *ex Scalesia helleri* (Ashlock).

Specimens examined in the collection of the Darwin Research Station: Darwin Research Station: August 16, 1963, *ex Scalesia* (D. Snow); Bella Vista Trail: August 23, 1963, *ex Scalesia* (D. Snow).

Estola insularis cribrata Blair.

Estola cribrata Blair, 1933, Ann. Mag. Nat. Hist., ser. 10, vol. 11, p. 483.

Ground color dark reddish brown, short recumbent ashy pubescence uniform over surface, not irrorate. Pronotum with lateral spines small; disk with punctures contiguous, often confluent. Length, 7–10 mm.

Type locality. Albemarle (Isabela) Island.

Host plant. *Scalesia gummifera.*

The uniform depressed ashy pubescence and small pronotal spines will separate this subspecies from the typical form.

Material examined. Tagus Cove, Isabela Island: 6 ♂♂, 5 ♀♀, January 30, 1964, *ex Scalesia gummifera* (R. L. Usinger).

Estola insularis duncani Van Dyke.

Estola duncani Van Dyke, 1953, Occ. Pap. Calif. Acad. Sci., no. 22, p. 135.

Ground color pale reddish brown, appressed pubescence reddish brown interspersed with patches of ashy. Pronotum with lateral spines small, disk subconfluently punctate. Length, 10 mm.

Type locality. Duncan (Pinzón) Island.

A single specimen, the female holotype, is the only sample available for study. Judging from this unique individual, the population of Pinzón Island presumably differs from the nomino-typical form in coloration, the punctation of the pronotum, and the smaller pronotal spine. The mottled pubescence distinguishes it from *E. i. cribrata*.

Estola insularis nigrescens Linsley and Chemsak, new subspecies.

Ground color reddish black to black, short recumbent pubescence usually dark brownish with ashy hairs uniformly interspersed often into patches, longer subdepressed hairs with dark tinge. Pronotum with disk convex, confluently punctate, lateral spines small. Elytra with basal punctures coarse, subconfluent. Antennae with black annulations becoming broader toward apex. Length, 7–10 mm.

Holotype ♂, allotype ♀ and 15 paratypes (8 ♂♂, 7 ♀♀) from Black Beach, Floreana Island, February 15, 1964, *ex Scalesia affinis* (E. G. Linsley, R. L. Usinger); additional paratypes as follows: 1 ♀, Black Beach, February 18, 1964, *ex Scalesia affinis* (G. Kuschel); 2 ♂♂, 1 ♀, Moist Forest, 300 meters above Black Beach, February 14, 1964, *ex Scalesia pedunculata* (Kuschel); 2 ♂♂, Moist Forest, February 17, 1964, *ex Scalesia pedunculata* (Usinger).

The very dark ground coloration distinguishes this subspecies from other known Galápagos populations.

Estola insularis subspecies.

For the present, available material will not permit definite subspecific assignments for the following:

Santiago Island: One ♂, January 5, 1906 (F. X. Williams) resembles *E. i. duncani* in coloration but the pubescence is finer and more uniform, without the white patches.

Santa Fé Island: Two ♂♂, February 20, 1964, *ex Scalesia helleri* (E. G. Linsley, R. L. Usinger). These may belong to the nearby Santa Cruz Island population.

Fernandina Island: Three ♂♂, February 5, 1964, *ex Scalesia cordata* (P. D. Ashlock) collected on the southwest part of the island, have a coloration like that expressed in the Isabela population (*E. i. cribrata*). Further, the appressed pubescence is similarly uniform in nature but the long suberect setae are almost twice the length of that found in Isabela sample.

Nesozineus Linsley and Chemsak, new genus.

Form robust, usually small; pubescence short, dense, uniformly recumbent, erect hairs absent. Head small, front convex, rectangular; eyes large, coarsely faceted, deeply emarginate, lower lobe large, transverse, upper lobes separated by about diameter of third antennal segment; palpi short, subequal, apical

segments pointed; antennae slender, eleven segmented, third segment longer than scape, fourth longer than third, fifth shorter than fourth but longer than third, remaining segments gradually decreasing in length, erect hairs totally absent. Pronotum transverse, sides behind middle with a small acute tubercle, basal transverse impression broad, beginning immediately behind lateral tubercles, not extending completely over dorsum; disk with three broad calluses, a basal median partially glabrous one and two pubescent ones before middle; prosternum narrow, prosternal process arcuate, about as broad as half the coxal width, expanded behind, coxal cavities closed; mesosternal process broad, concave, each side with a small posterior tubercle, intermediate coxal cavities closed; scutellum broader than long, apically subtruncate. Elytra convex, subparallel to apical one-fourth then tapering to rounded apices; humeri prominent, two large tumid areas present behind scutellum, each elytron with a broad costa-like swelling extending from humeri to apical one-third; erect hairs absent. Legs small, femora moderately clavate; hind tarsi with first segment about half as long as two following segments together. Abdomen normally segmented, fifth sternite longer than fourth.

Type species. *Leptostylus galapagoensis* Van Dyke.

This genus has the facies of *Leptostylus* and shares several characteristics with it. However, the acute lateral tubercles of the prosternum and small tubercles of the mesosternum distinguish *Nesozineus*. Its affinities appear to be with *Ozineus* but the short posterior tarsi readily separate it.

Van Dyke (1953) suggested relationships within *Atrypanius* and *Trypanidius*, but had no female specimens to observe the presence or absence of an elongate ovipositor.

Nesozineus galapagoensis (Van Dyke).

Leptostylus galapagoensis Van Dyke, 1953, Occ. Pap. Calif. Acad. Sci., no. 22, p. 136.

Moderately large to small, ground color usually reddish brown. Surface densely clothed with thick recumbent ashy, yellowish, and darker pubescence interrupted only by coarse or small punctures. Pronotum densely punctate, often with darker spots. Elytra varying from almost concolorous to extensively dark maculate, erect hairs totally absent. Legs with femora often darker. Length, 5–10 mm.

Type locality. Isabela Island.

This species is presently known from six of the islands. Available material consists of a very large series from Santa Cruz, a moderate but distinctive series from Isabela, and single specimens from Santiago, Rábida, San Cristóbal, and Fernandina. This material indicates distinct subspecific differences between the populations on Santa Cruz and Isabela. Although the other island populations are represented by unique specimens, we retain the available name for the Santiago Island group.

Nesozineus galapagoensis galapagoensis (Van Dyke).

Leptostylus galapagoensis Van Dyke, 1953, Occ. Pap. Calif. Acad. Sci., no. 22, p. 136, pl. 7, fig. 1.

Size moderately large; ground color reddish brown, dense appressed pubescence with yellowish tinge, uniform except for shining coarse punctures. Elytra with pubescence usually concolorous except for two small dark sutural patches at apical one-fourth. Punctures of pronotum and elytra coarse, very distinctly interrupting pubescence. Length, 7–10 mm.

Type locality. Villamil, Albemarle (Isabela) Island.

This subspecies is distinctive by its larger average size, reduced elytral maculations, and larger punctures.

Material examined. 15 ♂♂, Villamil, Isabela Island, March 14, 1906 (F. X. Williams).

Nesozineus galapagoensis williamsi (Van Dyke).

Leptostylus williamsi Van Dyke, 1953, Occ. Pap. Calif. Acad. Sci., no. 22, p. 137.

Size small; ground color reddish brown, legs darker; pubescence fine, dense, ashy and dark brown. Elytra maculate with brown patches at base, broadly at middle, and near apex; punctures fine. Length, 6 mm.

Type locality. James (Santiago) Island.

In spite of the fact that this population is represented by a unique specimen (the holotype), this example differs sufficiently from those on Isabela to suggest that it probably represents a separate subspecies.

Material examined. 1 ♂, James Island, March 2, 1906 (F. X. Williams).

Nesozineus galapagoensis variabilis Linsley and Chemsak, new subspecies. (Figure 25.)

Form small to moderate sized; ground color reddish brown, antennae paler; pubescence ashy, brownish, and black, thick. Head usually yellowish pubescent. Elytra very variable, dark patches either reduced to small subapical spots or extensively dark maculated basally, post medially and subapically; punctures small, well separated, not greatly breaking continuity of appressed pubescence. Pronotum usually with darker spots. Length, 5–10 mm.

Holotype ♂, allotype ♀ from Darwin Research Station, Santa Cruz Island, February 1, 1964, at white light (E. G. Linsley); paratypes (see table 5). Additional material from Santa Cruz Island includes: 1 ♀, April 27 (D. Q. Cavagnaro); 1 ♂, Lower Arid Zone, Academy Bay, January 24, *ex Croton scouleri* (Linsley); 1 ♂, Moist Forest Zone, 240 meters above Academy Bay, January 28–February 1, at white light (G. Kuschel); 2 ♂♂, Horneman Ranch, March 2 and April 8 (Cavagnaro).

Specimens examined in the collection of the Darwin Research Station: Dar-

Table 5. *Samples of* Nesozineus galapagoensis variabilis *collected at light at Darwin Research Station, Santa Cruz Island, 1964 (E. G. Linsley, R. L. Usinger, R. O. Schuster, G. Kuschel, D. Q. Cavagnaro, I. Wiggins, collectors). All material paratypical.*

January	♂	♀	*February*	♂	♀
20	35	30	1[3]	5	10
21	23	10	2	5	3
22	12	8	3[4]	10	6
23[1]	10	6	4	12	6
26[2]	4	5	5[5]	4	7
27	5	2	6[6]	18	26
28	8	6	7	12	10
29	6	4	8	–	1
30	3	–	9	12	5
31	4	3	10	4	4
			12	5	3
			14	2	5
			15	–	1
			18	5	10
			20	1	1
			21	5	6
			22	2	1
			23[7]	1	2
			24	3	5
			26	–	1

[1] 2 ♂♂ *ex Laguncularia racemosa.*
[2] 1 ♂ *ex Laguncularia racemosa.*
[3] 1 ♂, 2 ♀♀ *ex Croton scouleri.*
[4] Also flying in late afternoon.
[5] Also *ex Croton scouleri.*
[6] Also flying in late afternoon and as pupae in dead branches of *Croton scouleri.*
[7] Also *ex Hippomane mancinella.*

win Research Station, at light: August 17, 1963 (D. Snow); September 6, 11, 14, 17, 1963 (D. Snow).

Larvae of this subspecies were found by G. Kuschel in dead branches (2–3 cm. in diameter) of *Croton scouleri* which were still attached to living trees. The larvae work beneath the bark for a period, then bore into the sapwood and heartwood. Emergence holes of adults averaged about 3 × 2.5 mm. in diameter.

Adults usually fly in the late afternoon but on overcast days during midday.

Nesozineus galapagoensis subspecies.

Three unique specimens, a ♂ from Fernandina Island (F. Ortiz); a ♀ from Baquerizo Morene, San Cristóbal Island, February 22, 1964 (R. L. Usinger); and a ♀ from Rábida Island, December 18, 1905 (F. X. Williams) cannot be assigned to any of the preceding subspecies. They probably represent distinctive populations but adequate samples will be necessary before a conclusion can be reached.

Species recorded from the Galápagos Islands but of Doubtful Occurrence

Eburia amabilis Boheman.

Eburia amabilis Boheman, 1859, Konliga Svenska Fregatten *Eugenies* resa . . . , Zool., vol. 1, p. 150.

Male. Integument testaceous, head, antennae, and prothorax orangish; pubescence sparse, minute and appressed and long and erect. Head narrower than pronotum; area between antennal tubercles slightly concave; vertex impunctate, clothed with minute golden appressed pubescence except for a glabrous median line which diverges toward neck; eyes finely densely pubescent internally; antennae extending about four segments beyond body, scape subglabrous, impunctate, slightly flattened above, third segment longer than first, fourth shorter than third, fifth and sixth subequal to fourth, eleventh longer than tenth, appendiculate, basal segments sparsely pubescent, internally clothed with long suberect hairs which diminish in number apically. Pronotum about as long as broad, sides with acute, backward curved spines, base constricted, broadly shallowly impressed; disk with two dark antemedian tubercles; surface opaque, finely pubescent and vaguely, shallowly punctate except for the shining rugose lateral areas extending from apex to lateral tubercles; median line vague, not highly elevated; scutellum small, rounded behind, finely pubescent. Elytra almost three times as long as broad; two pairs of moderate sized, contiguous eburneous ridges present basally, two elongate pairs present at middle, the outside pairs over twice as long as basal ones and the inside pair almost twice as long as the basal pairs, ridges with a few long suberect hairs and dark spots at base of basal pairs and at each end of median pairs; punctures at base moderately coarse, contiguous, becoming very fine at apex; disk sparsely clothed with minute golden pubescence and longer suberect hairs; apices truncate, outer angles with a moderate spine, sutural angles unarmed. Legs with middle and hind femora spined internally, spines subequal in length to elytral ones. Length, 14 mm.

Type locality. "Insulae Gallapagos."

The above description was drawn from the type specimen kindly made available to us by E. Kjellander. There is some doubt as to the actual occurrence of this species on the Galápagos Islands. It has not been collected since the voyage of the *Eugenie* and there is a possibility of error in labeling. Similar discrepancies have been discussed by Van Dyke (1953; p. 94) and Aurivillius (1893).

Taeniotes hayi (Mutchler).

Monochamus hayi Mutchler, 1938, Amer. Mus. Novitates, no. 981, p. 13.

Taeniotes hayi, Dillon and Dillon, 1941, Reading Publ. Mus. Art. Gal., Sci. Publ., vol. 1, p. 17 (synonymy).

Monochamus cocoensis Mutchler, 1938, Amer. Mus. Novitates, no. 981, p. 13.

A black, shining species with the scutellum and a spot on each side white pubescent and the elytra vaguely white pubescent along the suture, especially at the apex. The antennal scape is robust and the sides of the pronotum prominently spined. The antennae are unusually long in the male.

Type locality. Of *M. hayi*, "Indefatigable Island"; *M. cocoensis*, Cocos Island.

The type specimen of this species, which appears to be relatively common on Cocos Island, may have been mislabeled. In any event, its occurrence in the Galápagos is highly problematical.

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